

## ABUNDANCE OF SPIDERS ON GRAPEVINES AND APPLE TREES IN EL SADAT CITY, MENOFIA GOVERNORATE, EGYPT

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### ABSTRACT

Using plant shaking and hand sorting collecting methods at El Sadat city in Menofia Governorate, Egypt, sixteen families of spiders were recorded in this study which was conducted on two horticulture plantations, Grapevine (*Vitis vinifera*) and Apple tree (*Malus domestica*). 28 genera and 24 identified species were obtained. The identification of some families, genera and species is difficult in some cases. Juvenile specimens are useless and unidentifiable even to genus level. Apple trees were with the most plant harbored spiders. The most dominant families recorded and represented with the largest number of species were Gnaphosidae, Philodromidae, Salticidae, Theridiidae and Thomisidae. The fewest species belonged to Araneidae, Eutichuridae, Oecobiidae, Oxyopidae, Scytodidae, Trachelidae and Uloboridae families. Some families are identified to the family species only, i.e. Agelenidae, Dictynidae, Linyphiidae and Liocranidae.

**Key words:** Abundance, Spiders, Grapevine, Apple trees, Menofia Governorate, Egypt.

### INTRODUCTION

Spiders can inhabit all types of the habitats and ecosystems. They have a large area of distribution, from the poles to the centers of the continents and from sea level to 5000 m. elevations (Foelix, 1996). However, most spiders live in terrestrial ecosystems. Mostly, they dwell on the ground in gardens and fields or live on webs on vegetation. Spiders that live in continental ecosystems are defined as effective predators of insects and other arthropods. Spiders live together with insects in agricultural ecosystems. Ecological investigations on spiders demonstrated that spiders can control insects and their larvae in terrestrial ecosystems, (Maloney *et al.*, 2003).

Therefore, they can play important role in pest control. Currently, there are 46,358 species of spiders in the world (World Spider Catalog, 2016) and a total of 385 species of spiders are known from Egypt (El-Hennawy, 2006).

Detailed knowledge of the biodiversity of spider communities on agricultural reclaimed land is important both in terms of enhancing pest control and understanding the driving forces influencing nature conservation value (Downie *et al.*, 1999). El Sadat city, Menofia governorate is a unique location in Egypt because its reclaimed area is located between desert and Nile delta, so that the study of its fauna is necessary to understand the zoogeographic relationships, especially spiders wise, between it and the other governorates. The purpose of the present study is to provide information on incidence of spider communities associated with both horticulture plantations, Grapevine (*Vitis vinifera*) and Apple (*Malus domestica*) at El Sadat city in Menofia Governorate, Egypt and also because, the Grapevine is one of the most important horticulture crops for local use or export in Egypt.

## MATERIALS AND METHODS

Field work was conducted at Khatatba location, El Sadat city, Menofia Governorate (10 km. off the desert road) which is characterized by notable reclamation projects and agricultural extension using different vegetables, field crops and horticulture plantations depending on both Nile and underground water.

Two horticulture plantations were chosen, Grapevine (*Vitis vinifera*) and Apple tress (*Malus domestica*).

For grapevine, location was 30° 43' 23.1" E & 30 ° 20' 37.7" N, an area of about 10 feddan was chosen cultivated with ten years old grapevine trees during the period of the investigation, (Figure 1). Apple trees location is 30 ° 43' 22.2" E & 30° 20' 20.5" N, an area about 15 feddan was chosen, cultivated with 12 years old apple trees during the period of investigation, (Figure 2).

Collection methods were beating net (branch shaking) and hand sorting method. Careful shaking of the plants occurred five times for each sample over a collection cloth. After shaking, the specimens were individually picked up in plastic vials (2/5 cm); while larger ones kept in vial (3/6 cm). The hand sorting method was used to pick the individuals found around each plant and under stones besides these trees and individually kept in plastic vials of 3/6 cm). Samples of about 25 trees randomly distributed in every selected orchard were examined for the collection of different spiders. Spiders were collected from branches, leaves, flowers, on the ground and under the stones and grasses.

All specimens were transferred to the laboratory for counting and identification after putting in 9 cm containers filled with 70% ethyl alcohol. Examination and identification were carried out with the aid of stereomicroscope.

The identification of adult female depended on the epigynal plate, but in case of male, the palp anatomy was an important factor for identification.

According to their taxonomic importance, palpal and epigynum organs were preserved in small vials (0.5 x 1.5 cm) in 70% ethyl alcohol and 5% glycerin. The identification of specimens was executed in the light of available taxonomical knowledge followed the systems used by Petrunkevitch (1939), Kaston (1978) and Jocque & Dippenaar-Schoeman (2007), taking in consideration that the group of Arachnida is poorly studied in this geographical area and areas of Egypt (El-Hennawy, 2003). Juvenile spiders were identified to family or genus level, if possible. Active population density of spider fauna was measured for one year every one month from November, 2013 to November, 2014. The specimens were preserved in the Spider Research Laboratory, Fruit Acarology Department, Plant Protection Research Institute, A.R.C. The seasons examined were Summer, Spring and Autumn only.

## RESULTS AND DISCUSSION

A total of 28 species and 24 genera of spiders from two horticulture plantations, Grapevine and Apple trees were collected. The largest number of species belong to the following families: Gnaphosidae, Philodromidae, Salticidae, Theridiidae and Thomisidae; the fewest species belonged to Araneidae, Eutichuridae, Oecobiidae, Oxyopidae, Scytodidae, Trachelidae and Uloboridae families. Some families are identified to the family species only, those families were Agelenidae, Dictynidae, Linyphiidae and Liocranidae. The spider species determined are given in Table 1 and the photographs of selected species are found after the tables.

**Table 1** Spider species collected from the Grapevines and Apple orchards and their distribution

Family	Genus	Species	Grapevines	Apple
Agelenidae	-	-	+	-
Araneidae	<i>Cyrtophora</i>	<i>citricola</i> (Forskal, 1775)	+	+
Dictynidae	-	-	+	+
Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i> (Cambridge, 1874)	+	+
Gnaphosidae	<i>Poecilochroa</i>	<i>pugnax</i> (Cambridge, 1874)	-	+
	<i>Pterotricha</i>	sp.	+	-
	<i>Setaphis</i>	<i>subtilis</i> (Simon, 1897)	+	-
	<i>Synaphosus</i>	<i>syntheticus</i> (Chamberlin, 1924)	-	+
	<i>Zelotes</i>	<i>nilicola</i> (Cambridge, 1874)	+	-
	<i>Zelotes</i>	<i>tenuis</i> (Koch, 1866)	-	+
	<i>Zelotes</i>	sp.	+	+
Linyphiidae	-	-	+	+
Liocranidae	-	-	+	-
Oecobiidae	<i>Uroctea</i>	<i>limbata</i> (Koch, 1843)	-	+
Oxyopidae	<i>Peucetia</i>	<i>arabica</i> Simon, 1882	-	+
Philodromidae	<i>Philodromus</i>	sp.	-	+
	<i>Thanatus</i>	<i>vulgaris (albini)</i> Simon, 1875	+	+
Salticidae	<i>Aelurillus</i>	sp.	+	+
	<i>Myrmarachne</i>	sp.	-	+
	<i>Plexippus</i>	<i>paykulli</i> (Audouin, 1825)	+	+
	<i>Pseudicius</i>	<i>spiniger</i> (Cambridge, 1872)	+	-
	<i>Synageles</i>	sp.	+	-
	<i>Thyene</i>	<i>imperialis</i> (Rossi, 1846)	+	+
Scytodidae	<i>Scytodes</i>	<i>velutina</i> Heineken & Lowe, 1836	+	+
Theridiidae	<i>Euryopsis</i>	<i>albomaculata</i> Denis, 1951	-	+
	<i>Kochiura</i>	<i>aulica</i> (Koch, 1838)	+	+
	<i>Latrodectus</i>	<i>tredecimguttatus</i> (Rossi, 1790)	+	-
	<i>Paidiscura</i>	<i>dromedaria</i> (Simon, 1880)	+	-
	<i>Theridion</i>	<i>incanescens</i> Simon, 1890	+	+
	<i>Theridion</i>	<i>jordanense</i> Levy & Amitai, 1982	+	+
	<i>Theridion</i>	<i>melanostictum</i> Cambridge, 1876	+	+
Thomisidae	<i>Runcinia</i>	<i>grammica</i> (Koch, 1837)	+	+
	<i>Thomisus</i>	<i>citrinellus</i> Cambridge, 1872	+	+
	<i>Xysticus</i>	sp.	+	-
Trachelidae	<i>Trachelas</i>	<i>minor</i> (Cambridge, 1872)	-	+
Uloboridae	<i>Uloborus</i>	sp.	+	-

For grapevines, the highest population of collected specimens belonged to the family Theridiidae (65.43%), followed by Salticidae (14.54%) and the lowest population belonged to the family Araneidae (0.74%), Philodromidae (0.44%), Linyphiidae (0.29%), Liocranidae (0.29%) and Uloboridae (0.29%) respectively, on the other hand, the families Oecobiidae, Oxyopidae and Trachelidae did not exist on grapevine during the period of investigation, Table 2.

For apple trees, the highest population of collected specimens belonged to the family Theridiidae (42.29%), followed by Salticidae (21.06%) and Gnaphosidae (10.68%). The lowest population belonged to the family Araneidae (0.61%) and Trachelidae (0.30%) respectively; on the other hand, family Agelenidae, Liocranidae and Uloboridae did not exist on apple trees during the period of investigation, Table 3.

**Table 2** Spider families collected from the Grapevine trees, sex and immature number of species from each family.

Family	♂	♀	I	TIN	%
Agelenidae	-	1	6	7	1.03
Araneidae	2	1	2	5	0.74
Dictynidae	2	2	14	18	2.67
Eutichuridae	2	1	24	27	4.00
Gnaphosidae	9	3	15	27	4.00
Linyphiidae	-	1	1	2	0.29
Liocranidae	1	-	1	2	0.29
Oecobiidae	-	-	-	-	-
Oxyopidae	-	-	-	-	-
Philodromidae	1	-	2	3	0.44
Salticidae	25	5	68	98	14.54
Scytodidae	3	4	10	17	2.52
Theridiidae	96	126	219	441	65.43
Thomisidae	6	3	16	25	3.70
Trachelidae	-	-	-	-	-
Uloboridae	1	-	1	2	0.29

I= Immature, TIN = Total Individual Number, % = Frequency

Tables 4 to 16 show the total number of spider families, genera and species identified as much as possible, obtained from the grapevines and apple trees divided into adult (male and female) and juveniles during the period of investigation. Three families were recorded according to their high population; Theridiidae is the highly dominant family (730 individuals) in the two orchard trees (Grapevines and Apple), this family was represented by seven species, *Euryopsis albomaculata*, *Kochiura aulica*, *Latrodectus tredecimguttatus*, *Paidiscura dromedaria*, *Theridion jordanense*, *Theridion incanescens* and *Theridion melanostictum*. All of these species are new locality records in Egypt. They were not recorded before from Menoufia Governorate (El-Hennawy, 2006). For the Grapevines, *Kochiura aulica* was the most dominant species while *Theridion melanostictum* followed by *Kochiura aulica* is dominant on Apple.

**Table 3** Spider families collected from the Apple trees, sex and immature number of species from each family.

Family	♂	♀	I	TIN	%
Agelenidae	-	-	-	-	-
Araneidae	-	1	3	4	0.61
Dictynidae	2	2	12	16	2.44
Eutichuridae	2	8	25	35	5.34
Gnaphosidae	14	5	51	70	10.68
Linyphiidae	-	-	9	9	1.37
Liocranidae	-	-	-	-	-
Oecobiidae	5	1	2	8	1.22
Oxyopidae	1	-	6	7	1.06
Philodromidae	6	7	16	29	4.42
Salticidae	33	19	86	138	21.06
Scytodidae	10	5	23	38	5.80
Theridiidae	59	57	161	277	42.29
Thomisidae	6	5	11	22	3.35
Trachelidae	1	1	-	2	0.30
Uloboridae	-	-	-	-	-

I= Immature, TIN=Total Individual Number, % =frequency

Family Salticidae is the second dominant one during this investigation with 237 individuals from Grapevines and Apple trees, represented by six species, *Aelurillus* sp., *Myrmarachne* sp., *Plexippus paykulli*, *Pseudicius spiniger*, *Synageles* sp. and *Thyene imperialis*. These species too are new locality records from Menoufia Governorate, Tables (4-16). *Plexippus paykulli* is the most dominant species, then *Aelurillus* sp. and *Thyene imperialis* respectively, during the period of investigation. These results disagree with Hussein *et al.* (1998) who reported that Salticidae is rare in the agro-ecosystem, however, it was recorded as a common family in desert locations in his study.

Family Gnaphosidae is the third one in population during this study, with 91 individuals from Grapevines and Apple trees, represented by seven species, *Poecilochroa pugnax*, *Pterotricha* sp., *Setaphis subtilis*, *Synaphosus syntheticus*, *Zelotes nilicola*, *Zelotes tenuis* and *Zelotes* sp.. *Zelotes* sp., this genus is the most dominant species in population then *Setaphis subtilis* and *Poecilochroa pugnax* during the period of this study. All of these species except *Setaphis subtilis* and *Zelotes nilicola* recorded as a new locality record from Menoufia Governorate (El-Hennawy, 2006).

The rest of the families were recorded in moderate and few numbers during the period of investigation and represented as following: Araneidae (*Cyrtophora citricola*), Eutichuridae (*Cheiracanthium isiacum*), Oecobiidae (*Uroctea limbata*), Oxyopidae (*Peucetia arabica*), Philodromidae (*Philodromus* sp. and *Thanatus vulgaris* (this species is known in Egyptian papers as *Thanatus albini*), Scytodidae (*Scytodes velutina*), Thomisidae (*Runcinia grammica*, *Thomisus citrinellus* and *Xysticus* sp.), Trachelidae (*Trachelas minor*) and Uloboridae (*Uloborus*

sp.). There are four families identified to the family level only during this period of investigation, Agelenidae, Dictynidae, Linyphiidae and Liocranidae. Also, during this investigation, family Liocranidae and Trachelidae (*Trachelas minor*) recorded one time in this study.

**Table 4** Total number of spider species during November, 2013

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
12/11/2013	Grape	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	5	5
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	2	3
			<i>Synageles</i>	sp.	1	-	5	6
			<i>Thyene</i>	<i>imperialis</i>	1	-	3	4
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	11	15	17	43
			<i>Theridion</i>	<i>incanescens</i>	1	2	1	4
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	1		2	3
Total					16	17	35	68
	Apple	Araneidae	<i>Cyrtophora</i>	<i>citricola</i>	-	-	1	1
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	1	8	9
		Linyphiidae			-	-	2	2
		Oxyopidae	<i>Peucetia</i>	sp.	-	-	1	1
		Philodromidae	<i>Thanatus</i>	<i>vulgaris</i> ( <i>albini</i> )	-	-	1	1
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	3	-	-	3
			<i>Thyene</i>	<i>imperialis</i>	1	-	-	1
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	4	3	16	23
			<i>Theridion</i>	<i>incanescens</i>	1	1	-	2
			<i>Theridion</i>	<i>jordanense</i>	1	1	-	2
			<i>Theridion</i>	<i>melanostictum</i>	2	5	20	27
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	-	-	1	1
Total					12	11	50	73
Monthly Total					28	28	85	141

Considering the occurrence of spiders, the highest densities of population begin from August and reach high population in November, (Tables 13 to 16), while the lowest population was in February (Table 7), this is in agreement with Ghabbour *et al.* (1999) and Hussein (1999) who recorded that the peak of active population density in August followed by rather high values in September and lower active population density in February during his spiders study in some vegetable plants in Menoufia Governorate.

Family Trachelidae and all the previous recorded species considered as new locality records in Egypt, they were not recorded before from Menoufia Governorate (El-Hennawy, 2006) except *Cheiracanthium isiacum* (Eutichuridae), *Setaphis subtilis* and *Zelotes nilicola* (Gnaphosidae), *Thanatus vulgaris* (Philodromidae), *Kochiura aulica* (Theridiidae) and *Thomisus citrinellus* (Thomisidae).



**Table 5** Total number of spider species during December, 2013  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
16/12/2013	Grape	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	1	-	3	4
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	1	2
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	2	1	30	33
			<i>Theridion</i>	<i>incanescens</i>	-	1	5	6
			<i>Theridion</i>	<i>melanostictum</i>	9	6	9	24
Total					13	8	48	69
	Apple	Dictynidae			-	-	2	2
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	1	-	1
		Salticidae	<i>Thyene</i>	<i>imperialis</i>	2	3	4	9
			<i>Myrmarachne</i>	sp.	1	1	1	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	1	-	2
			<i>Theridion</i>	<i>melanostictum</i>	3	6	1	10
			<i>Euryopsis</i>	<i>albomaculata</i>	1	1	-	2
Total					8	13	8	29
Monthly Total					21	21	56	98

**Table 6** Total number of spider species during January, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
10/1/2014	Grape	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	1	1	2
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	-	1	1	2
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	2	17	20
			<i>Theridion</i>	<i>incanescens</i>	-	-	3	3
			<i>Theridion</i>	<i>melanostictum</i>	2	4	5	11
Total					3	8	27	38
	Apple	Dictynidae			-	-	1	1
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	3	3
		Salticidae	<i>Thyene</i>	<i>imperialis</i>	1	-	4	5
			<i>Myrmarachne</i>	sp.	-	-	2	2
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	-	3	4
			<i>Theridion</i>	<i>melanostictum</i>	2	1	4	7
			<i>Euryopsis</i>	<i>albomaculata</i>	-	-	1	1
Total					4	1	18	23
Monthly Total					7	9	45	61

**Table 7** Total number of spider species during February, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
11/2/2014	Grape	Araneidae	<i>Cyrtophora</i>	<i>citricola</i>	1	1	1	3
		Dictynidae			-	1	1	2
		Gnaphosidae	<i>Setaphis</i>	<i>subtilis</i>	1	-	3	4
			<i>Zelotes</i>	<i>nilicola</i>	1	-	-	1
		Salticidae	<i>Pseudicius</i>	<i>spiniger</i>	1	-	3	4
		Thomisidae	<i>Xysticus</i>	sp.	-	1	1	2
Total					4	3	9	16
	Apple	Dictynidae			-	1	1	2
		Eutichuridae	<i>Cheiracanthium</i>	sp.	-	-	2	2
		Oxyopidae	<i>Peucetia</i>	<i>arabica</i>	-	-	3	3
		Philodromidae	<i>Philodromus</i>	sp.	-	1	1	2
		Salticidae	<i>Aelurillus</i>	sp.?	1	-	1	2
			<i>Plexippus</i>	<i>paykulli</i>	-	3	8	11
		Theridiidae	<i>Theridion</i>	<i>melanostictum</i>	5	7	3	15
		Trachelidae	<i>Trachelas</i>	<i>minor</i>	1	1	-	2
Total					7	13	19	39
Monthly Total					11	16	28	55

**Table 8** Total number of spider species during March, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
11/3/2014	Grape	Agelenidae			-	-	3	3
		Dictynidae			-	1	9	10
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	2	2
		Gnaphosidae	<i>Pterotricha</i>	sp.	-	-	3	3
		Liocranidae			1	-	1	2
		Salticidae	<i>Aelurillus</i>	sp.?	1	-	7	8
			<i>Plexippus</i>	<i>paykulli</i>	1	-	2	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	-	4	5
			<i>Theridion</i>	<i>melanostictum</i>	2	-	3	5
Total					6	1	33	40
	Apple	Araneidae	<i>Cyrtophora</i>	<i>citricola</i>	-	1	1	2
		Dictynidae			1	1	2	4
		Gnaphosidae	<i>Synaphosus</i>	<i>syntheticus</i>	1	2	-	3
			<i>Zelotes</i>	<i>tenuis</i>	1	-	2	3



		Linyphiidae			-	-	2	2
		Philodromidae	<i>Thanatus</i>	<i>vulgaris</i> ( <i>albini</i> )	3	5	1	9
		Salticidae	<i>Aelurillus</i>	sp.?	2	-	1	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	4	2	2	8
			<i>Theridion</i>	<i>melanostictum</i>	6	5	4	15
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	1	-	1	2
			<i>Thomisus</i>	<i>citrinellus</i>	1	-	3	4
Total					20	16	19	55
Monthly Total					26	17	52	95

**Table 9** Total number of spider species during April, 2014

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
11/4/2014	Grape	Gnaphosidae	<i>Zelotes</i>	<i>nilicola</i>	2	-	3	5
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	2	5	3	10
			<i>Theridion</i>	<i>incanescens</i>	1	-	2	3
			<i>Theridion</i>	<i>jordanense</i>	-	1	4	5
			<i>Theridion</i>	<i>melanostictum</i>	4	5	7	16
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	-	1	-	1
		Philodromidae	<i>Thanatus</i>	<i>vulgaris</i> ( <i>albini</i> )	1	-	2	3
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	6	7
Total					11	12	27	50
	Apple	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	1	4	5
		Gnaphosidae	<i>Zelotes</i>	sp.	1	-	12	13
		Philodromidae	<i>Philodromus</i>	sp.	-	-	4	4
		Salticidae	<i>Aelurillus</i>	sp.?	1	-	4	5
			<i>Plexippus</i>	<i>paykulli</i>	1	-	2	3
			<i>Thyene</i>	<i>imperialis</i>	2	1	2	5
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	4	3	11	18
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	-	4	5
			<i>Theridion</i>	<i>melanostictum</i>	1	-	4	5
			<i>Theridion</i>	<i>incanescens</i>	-	1	3	4
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	-	-	1	1
Total					11	6	51	68
Monthly Total					22	18	78	118

**Table 10** Total number of spider species during May, 2014

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
13/5/2014	Grape	Agelenidae			-	1	3	4
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	3	6	10
			<i>Theridion</i>	<i>incanescens</i>	1	1	-	2
			<i>Theridion</i>	<i>jordanense</i>	1	-	4	5
			<i>Theridion</i>	<i>melanostictum</i>	2	1	3	6
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	3	-	1	4
Total					8	5	14	27
	Apple	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	1	-	1	2
		Gnaphosidae	<i>Zelotes</i>	sp.	2	-	3	5
		Salticidae	<i>Aelurillus</i>	sp.?	1	1	2	4
			<i>Plexippus</i>	<i>paykulli</i>	1	-	7	8
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	1	-	1	2
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	2	7	10
			<i>Theridion</i>	<i>jordanense</i>	1	1		2
			<i>Theridion</i>	<i>melanostictum</i>	1	3	2	6
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	1	-		1
Total					10	7	23	40
Monthly Total					18	12	37	67

**Table 11** Total number of spider species during June, 2014

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
16/6/2014	Grape	Dictynidae			1	-	2	3
		Gnaphosidae	<i>Zelotes</i>	sp.	1	-	3	4
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	2	2
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	3	4
			<i>Unidentified</i>		-	-	4	4
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	1	1	3	5
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	1	2	4
			<i>Theridion</i>	<i>melanostictum</i>	4	5	13	22
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	2	1	4	7
Total					11	8	36	55
	Apple	Dictynidae			1	-	2	3
		Gnaphosidae	<i>Zelotes</i>	sp.	1	-	4	5
		Salticidae	<i>Aelurillus</i>	sp.?	2	-	2	4

		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	2	1	1	4
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	-	-	3	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	3	3	7
			<i>Theridion</i>	<i>melanostictum</i>	1	2	1	4
Total					8	6	16	30
Monthly Total					19	14	52	85

**Table 12** Total number of spider species during July, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
6/7/2014	Grape	Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	5	5
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	2	-	4	6
			Unidentified		-	-	3	3
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	2	3	7	12
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	3	6	2	11
			<i>Theridion</i>	<i>melanostictum</i>	5	7	1	13
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	1	-	4	5
Total					13	16	26	55
	Apple	Gnaphosidae	<i>Zelotes</i>	sp.	2	-	4	6
		Salticidae	<i>Aelurillus</i>	sp.?	3	-	5	8
			<i>Plexippus</i>	<i>paykulli</i>	-	3	5	8
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	4	2	4	10
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	-	4	5
			<i>Theridion</i>	<i>melanostictum</i>	2	-	4	6
Total					12	5	26	43
Monthly Total					25	21	52	98

**Table 13** Total numbers of spider species during August, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
19/8/2014	Grape	Dictynidae			1	-	2	3
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	1	-	3	4
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	3	1	4	8
		Theridiidae	<i>Latrodectus</i>	<i>tredecimguttatus</i>	1	-	-	1
			<i>Kochiura</i>	<i>aulica</i>	1	-	4	5
			<i>Theridion</i>	<i>jordanense</i>	1	1	-	2
			<i>Theridion</i>	<i>melanostictum</i>	5	1	1	7
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	-	-	3	3
Total					13	3	17	33

	Apple	Dictynidae			-	-	2	2
		Gnaphosidae	<i>Zelotes</i>	sp.	2	1	7	10
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	1	2	3
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	2	-	4	6
			<i>Thyene</i>	<i>imperialis</i>	2	-	1	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	3	2	10	15
			<i>Theridion</i>	<i>jordanense</i>	1	-	6	7
			<i>Theridion</i>	<i>melanostictum</i>	9	3	3	15
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	1	3	3	7
Total					20	10	38	68
Monthly Total					33	13	55	101

**Table 14** Total numbers of spider species during September, 2014  
(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
16/9/2014	Grape	Gnaphosidae	<i>Setaphis</i>	<i>subtilis</i>	1	1	-	2
			<i>Zelotes</i>	sp.	1	-	1	2
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	1	2
			<i>Aelurillus</i>	sp.?	1	1	4	6
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	2	11	15	28
			<i>Theridion</i>	<i>melanostictum</i>	7	4	8	19
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	1	-	1	2
Total					14	17	30	61
	Apple	Dictynidae			-	-	1	1
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	2	2
		Gnaphosidae	<i>Poecilochroa</i>	<i>pugnax</i>	1	1	9	11
		Linyphiidae			-	-	2	2
		Oecobiidae	<i>Uroctea</i>	<i>limbata</i>	2	-	1	3
		Philodromidae	<i>Thanatus</i>	<i>valgaris (albini)</i>	1	-	4	5
		Salticidae	<i>Myrmarachne</i>	sp.	-	1	2	3
			<i>Thyene</i>	<i>imperialis</i>	-	1	8	9
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	-	-	2	2
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	4	14	19
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	-	1	1	2
Total					5	8	46	59
Monthly Total					19	25	76	120

**Table 15** Total numbers of spider species during October, 2014.

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
4/10/2014	Grape	Gnaphosidae	<i>Setaphis</i>	<i>subtilis</i>	1	-	-	1
			<i>Zelotes</i>	sp.	1	1	1	3
		Salticidae	<i>Aelurillus</i>	sp.?	1	-	1	2
			<i>Plexippus</i>	<i>paykulli</i>	1	1	2	4
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	4	12	13	29
			<i>Theridion</i>	<i>melanostictum</i>	6	4	9	19
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	1	-	-	1
Total					15	18	26	59
	Apple	Dictynidae			-	-	1	1
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	1	1	2	4
		Gnaphosidae	<i>Poecilochroa</i>	<i>pugnax</i>	2	1	9	12
		Linyphiidae			-	-	2	2
		Oecobiidae	<i>Uroctea</i>	<i>limbata</i>	3	1	1	5
		Philodromidae	<i>Thanatus</i>	<i>vulgaris</i> ( <i>albin</i> )	1	1	4	6
		Salticidae	<i>Myrmarachne</i>	sp.	-	-	2	2
			<i>Thyene</i>	<i>imperialis</i>	1	1	8	10
		Scytodidae	<i>Scytodes</i>	<i>velutina</i>	1	-	2	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	1	4	12	17
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	1	1	1	3
Total					11	10	44	65
Monthly Total					26	28	70	124

**Table 16** Total numbers of spider species during November, 2014.

(♂=adult male, ♀= adult female, J= Juvenile)

Date	Plant	Family	Genus	Species	♂	♀	J	Total
5/11/2014	Grape	Araneidae	<i>Cyrtophora</i>	<i>citricola</i>	1	-	1	2
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	-	3	3
		Gnaphosidae	<i>Setaphis</i>	<i>subtilis</i>	-	1	1	2
		Linyphiidae			-	1	-	1
		Salticidae	<i>Plexippus</i>	<i>paykulli</i>	1	-	4	5
			<i>Synageles</i>	sp.	-	-	6	6
			<i>Thyene</i>	<i>imperialis</i>	3	1	1	5
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	14	21	23	58
			<i>Paidiscura</i>	<i>dromedaria</i>	-	1	1	2

		Theridiidae	<i>Theridion</i>	<i>incanescens</i>	1	4	2	7
			<i>Theridion</i>	<i>melanostictum</i>	-	1	2	3
		Thomisidae	<i>Thomisus</i>	<i>citrinellus</i>	-	-	1	1
		Uloboridae	<i>Uloborus</i>	sp.	1	-	1	2
Total					21	30	46	97
	Apple	Araneidae	<i>Cyrtophora</i>	<i>citricola</i>	-	-	1	1
		Eutichuridae	<i>Cheiracanthium</i>	<i>isiacum</i>	-	3	1	4
		Gnaphosidae	<i>Poecilochroa</i>	<i>pugnax</i>	1	-	1	2
		Linyphiidae			-	-	1	1
		Oxyopidae	<i>Peucetia</i>	<i>arabica</i>	1	-	2	2
		Philodromidae	<i>Philodromus</i>	sp.	1	-	1	2
		Salticidae	<i>Aelurillus</i>	sp.?	-	2	5	7
			<i>Myrmarachne</i>	sp.	-	1	-	1
			<i>Plexippus</i>	<i>paykulli</i>	3	-	2	5
			<i>Synageles</i>	sp.	-	-	1	1
			<i>Thyene</i>	<i>imperialis</i>	1	-	2	3
		Theridiidae	<i>Kochiura</i>	<i>aulica</i>	2	-	22	24
			<i>Paidiscura</i>	<i>dromedaria</i>	-	1	-	1
			<i>Theridion</i>	<i>incanescens</i>	1	1	2	4
			<i>Theridion</i>	<i>melanostictum</i>	2	-	13	15
		Thomisidae	<i>Runcinia</i>	<i>grammica</i>	1	-	1	2
Total					12	8	55	75
Monthly Total					33	38	101	172



**Figure 1** Site of investigation spider fauna of Grapevine trees





**Figure 2** Site of investigation spider fauna of Apple trees



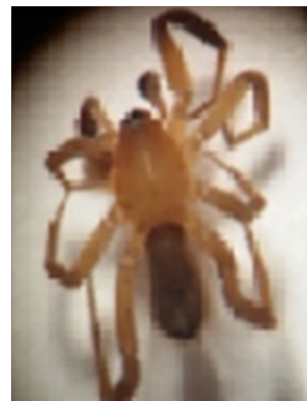
**Figure 3** Family Eutichuridae  
*Cheiracanthium isiacum*



**Figure 4** Family Gnaphosidae  
A: *Poecilochroa pugnax*



C: *Synaphosus syntheticus*



B: *Setaphis subtilis*



D: *Zelotes nilicola*



E: *Zelotes tenuis*



F: *Zelotes* sp.



**Figure 5** Family Oecobiidae  
*Uroctea limbata*



**Figure 6** Family Oxyopidae  
*Peucetia arabica*



**Figure 7** Family  
Philodromidae  
A: *Philodromus* sp.



B: *Thanatus vulgaris (albini)*



**Figure 8** Family Salticidae  
A: *Aelurillus* sp.



B: *Myrmarachne* sp.



C: *Plexippus paykulli*



D: *Thyene imperialis*



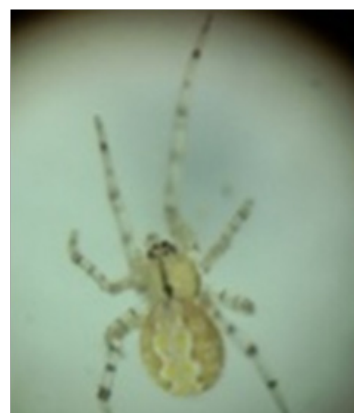
E: Salticidae,  
Unidentified species



**Figure 9** Family Scytodidae  
*Scytodes velutina*



**Figure 10** Family Theridiidae A: *Kochiura aulica*

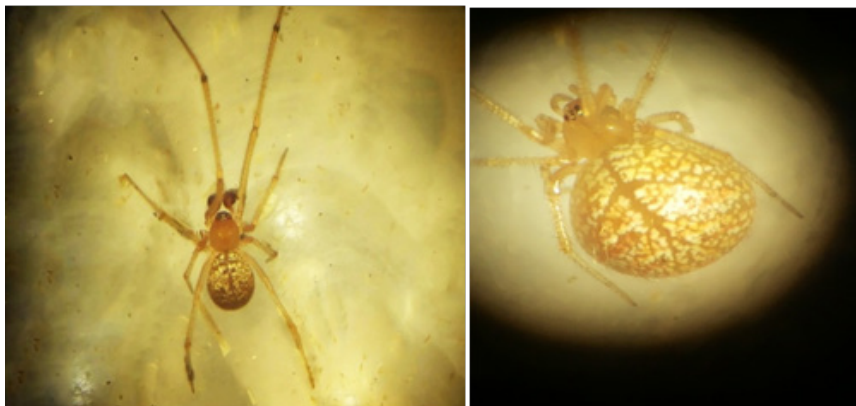


B: *Theridion incanescens*





C: *Theridion jordanense*



D: *Theridion melanostictum*



**Figure 11** Family Thomisidae  
A: *Runcinia grammica*



C: *Xysticus* sp.



B: *Thomisus citrinellus*



**Figure 12** Family Trachelidae  
*Trachelas minor*

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